

517 West Bridge Street Suite A Yerington NV 89447 775-463-9600 Office 775-463-9690 Fax

June 10, 2016

Mr. Jeryl Gardner, P.E., C.E.M.
Abandoned Mine Lands Program Coordinator,
NDEP Yerington Project Manager
Bureau of Corrective Actions
Nevada Division of Environmental Protection
901 S Stewart St #4001,
Carson City, NV 89701

Subject: Enhanced Evaporation Pilot Test Progress Report

Dear Jeryl,

This progress report is submitted in accordance with Paragraph 35(a) of the Agreement and Administrative Order on Consent for Response Action by Bona Fide Prospective Purchaser, Anaconda Mine, Operable Unit 8, between the State of Nevada, Department of Conservation and Natural Resources, Division of Environmental Protection (NDEP), and Singatse Peak Services LLC (SPS). The date of the Agreement is May 4, 2016. The pilot test is being performed in accordance with the work plan dated March 30, 2016, and which was approved by NDEP on April 11, 2016.

<u>Final Design</u> – Following NDEP approval of the work plan, SPS completed final design of the system. The final design of the system was generally in accordance with the work plan, but included minor modifications as summarized below. The design modifications were based on discussions with ARC, and with other companies that operate enhanced evaporations at other mine sites. This included SPS and Desert Engineering personnel attending a site visit at the Miami Copper Mine in Arizona on April 13, 2016. The design changes include the following:

- Change in the configuration and layout of the four irrigation panels on top of the VLT pad. This
  was done to minimize the earthwork required to level the evaporation site.
- Addition of an inline filter after the pump and before the sprinkler heads
- Use of the 25 hp Durco pump which required the addition of an auxiliary pump to allow for adequate flow rates and pressures anticipated for the system. Use of the Durco pump does not require any changes to the FMS pumping and contingency procedures used by Atlantic Richfield Company (ARC) for the FMS.
- The sprinkler heads designed by Nelson Irrigation were replaced with stainless steel heads designed by BETE, Inc. The 'super spray' heads designed by Senninger Irrigation were retained.
- A different type of moisture sensor was selected and installed as described in the work plan.
- Minor modifications to the piping and electrical system at the VLT pond.
- Elimination of the water truck approach at this time due to lack of availability of equipment. This
  decision may be reconsidered depending on the performance of the sprinkler system.

<u>Construction</u> – SPS retained Desert Engineering to construct the pilot test. Construction started on May 2, 2016 and was completed on May 25, 2016. The final design of the system is shown on the attached



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Figure. This figure shows the panel configuration, the location of pumps, valves, flow meter, pressure gages, moisture sensors and sprinkler heads. A detailed construction documentation report will be included in the Final Report to be prepared following the Notice of Final Completion.

<u>Startup</u> – Startup of the system occurred on May 26 – 27, 2016. The first day was spent reviewing the construction components and attending a Job Safety Analysis (JSA) of the startup and operation of the system. The JSA was attended by SPS and Desert Engineering personnel who will be operating the system. As a result of the JSA, several items were discussed, including the following:

- Pre-start and shut down procedures were prepared, including sequence for startup/shut down of the pumps
- Minor system modifications to eliminate H&S hazards such as tripping and hand safety
- Lock out tag out (LOTO) at the VLT pond for the pumping system
- Appropriate use of Personal Protective Equipment (PPE)
- Review of spill prevention and response activities

The system was pressure tested on the second day and was run for approximately 15 minutes. The pressure test identified two very small pinhole leaks in the existing piping between the VLT pond and the top of the VLT HLP. Both leaks were located on top of the liner system of the VLT HLP and no FMS fluids escaped off the liner. The leaks were repaired prior to normal operation of the system.

<u>Operation</u> – Normal operation of the system started on May 31, 2016. A daily observation form (attached) was prepared for use during operation. This form will be used to document weather conditions, pumping details such as flows and pressures and maintenance or other issues that require maintenance throughout the day. A summary of the operation up to the date of this report is attached to this progress report.

While it is expected to take several weeks of data to understand the system performance, initial observations show that significant evaporation is occurring. As suggested in your letter of April 11, 2016, we will set up a monthly conference call to discuss preliminary results and operational issues that may arise. Please contact me at (775) 463-9600 or via e-mail at tmassey@quaterra.com if you have any questions or comments.

Sincerely,

Taurus Massey,

**SPS Project Coordinator** 



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cc: Tom Patton, SPS

Gerald Prosalendis, SPS Steven Dischler Carla Consoli Greg Lovato, NDEP Jeff Collins, NDEP Harold Ball, EPA Dante Rodriguez, EPA Gene Seidlitz, BLM Dave Davis, BLM Jack Oman, ARC

## Attachments:

- 1. Final Design layout
- 2. Daily observation form
- 3. Summary of results through Jun 9





## **ENHANCED EVAPORATION PILOT TEST - DAILY OBSERVATION FORM**

GENERAL				
Date				
Time				
Operators				
Safety Brief				
Pump Start (time)				
Pump Stop (time)				
Pump run time (min)				

VLT POND CAPACITY	Depth (ft)	Gallons
Start		
End		
Difference		

FLOW METER READING (gpm)		
Flow (GPM)	Time	
Total (time min)		
Total (gallons)		

PRESSURE GAGE READINGS				
Pressure Reading	Time			

Final (%)

MOISTURE SENSORS	1	2	3	4	
			Manual Control of the		

WEATHER CONDITIONS (START)					
N. Station S. Static					
Temperature (deg)					
Wind Speed (mph)					
Wind Direction					
Relative Humidity (%)					
Bar Pressure (mm Hg)					
Cloud Cover					
Precipitation					

WEATHER CONDITIONS (END)			
	N. Station	S. Station	
Temp			
Wind Sp			
Wind Dir			
Humidity			
Pressure			
Cloud Cover			
Precip			

EVAP PANEL CONFIGURATION		
Active Panel	Time	
P1		
P2		
P3		
P4		

NSORS	1	2	3	4	5	6

	DAILY CHECKLIST
1	Safety briefing
2	Pre-start walk around
	Record weather conditions
	Record VLT pond elevation
	Check for leaks
	Pumps
	Valves in correct position
	Moisture Sensors (take reading)
	Sprinkler Heads
3	Start Pumps (sequence)
4	Walk around
	Check for leaks
	Pumps
	Valves
	Pressure (take reading)
	Flow (take reading)
	Sprinkler Heads
5	Observe/Document while pumping
	Check for leaks
	Pressure
	Flow
	Check top of VLT HLP for ponding
6	Stop Pumps (sequence)
7	Post walk around
	Record weather conditions
	Record VLT pond elevation
	Pumps
	Valves
	Moisture Sensors (take reading)
	Sprinkler Heads
8	Perform required maintenance

see test schematic on back

Maintenance/Comments des	cribe maintenance performed and other observations:
Main Pump Auxillary Pump Piping Valves Flow Meter Sprinkler Heads Moisture Sensors	
Auxillary Pump	
Piping	
Valves	
Flow Meter	
Sprinkler Heads	
Moisture Sensors	

## **Summary Table of Evaporation Pilot Test**

Date	Time Pumped (Minutes)	Volume Pumped	Comments
5/26/2015	0	(gal) -	pre-startup
5/27/2015	15		startup
0,11,1010			
5/31/2015			
6/1/2015	60	5,000	
6/2/2015	60		estimate only, flow meter inop, pinhole leak on liner
6/3/2015	128	15,900	first normal day
6/6/2015	114	15,000	
6/7/2015	115		2 shifts at 7,500 gal each
6/8/2015	75	10,000	
6/9/2015	73	10,000	
	CAG	77.350	
Total	640	77,350	